

# Tulsa Tornado Tribune



Where People Who Know the Weather Get Their Weather

National Weather Service Tulsa, Oklahoma

Winter, 2008 - 2009

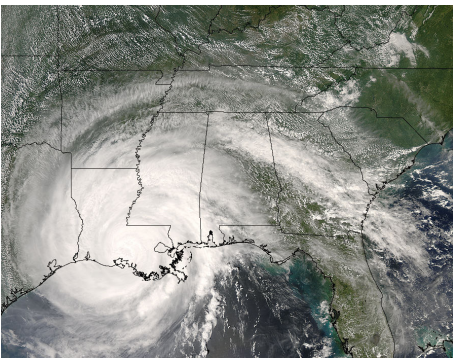
Craig Sullivan - Editor

## TROPICAL SYSTEMS BRING FLOODS, DAMAGING WINDS

Hurricanes "Gustav" and "Ike" impacted eastern Oklahoma and western Arkansas in a ten day span in early September, bringing heavy rain and high winds to much of the area.

After an already soggy spring and early summer, residents of eastern Oklahoma and western Arkansas began to brace themselves for more heavy rain. As August drew to a close, hurricane Gustav was moving through the Gulf of Mexico, and

As expected, Gustav made landfall in Louisiana on September 1, then slowly moved northwest and spread heavy rain into eastern Oklahoma and western Arkansas on the 2nd. From 7am on the 2nd through 7am on the 3rd, most locations east of a Hugo, OK to Bentonville, AR line received 2 to 5 inches of rain, with local amounts over 8 inches, while much less fell across the remainder of the area. The heaviest rainfall during this time frame fell across Haskell, Latimer, Le Flore, and Sebastian Counties. The observing station at Fort Smith Regional Airport recorded a record 24-hour rainfall for the month of September with 5.20" on the 2nd and 3rd, breaking the old 24-hour record for the month of 3.95".



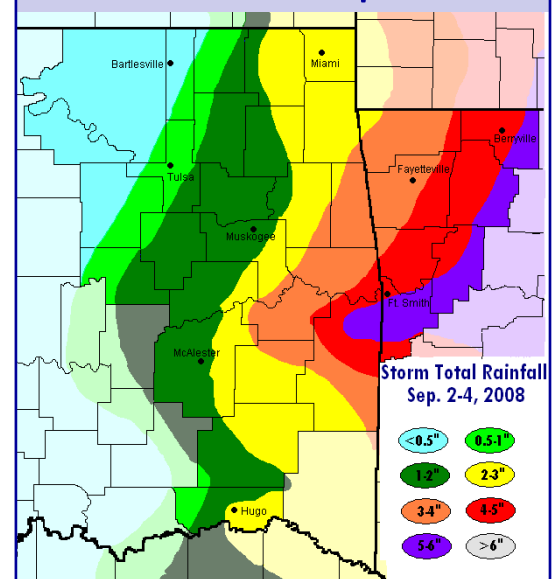
NASA Satellite photo of Hurricane Gustav shortly after making landfall...19:00 UTC (2 PM CDT) September 1, 2008.

threatening the Louisiana coast. The projected path brought Gustav's remnants toward northeast Texas, meaning potential for more heavy rain was increasing with time.

The center of Tropical Depression Gustav was located at the intersection of the state borders of Oklahoma, Texas, and Arkansas on the morning of the 3rd, and then slowly moved northeast and

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### Gustav's Impact



Widespread rainfall totals of 2 to 5 inches occurred with highest amounts affecting locations across northwest and west central Arkansas. Highest rainfall totals reported were as follows: 6NE Pettigrew, AR 6.64"; Greenwood, AR 6.39"; Spiro, OK 6.17"; 3WNW Eureka Springs, AR 5.88; Fort Smith, AR Regional Airport (FSM) 5.72".

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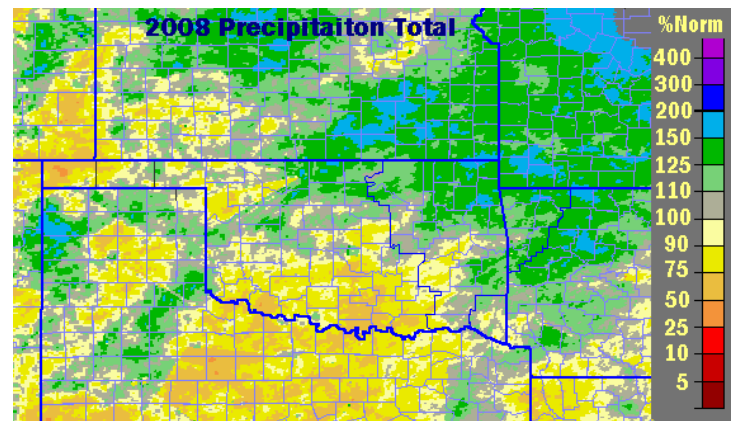
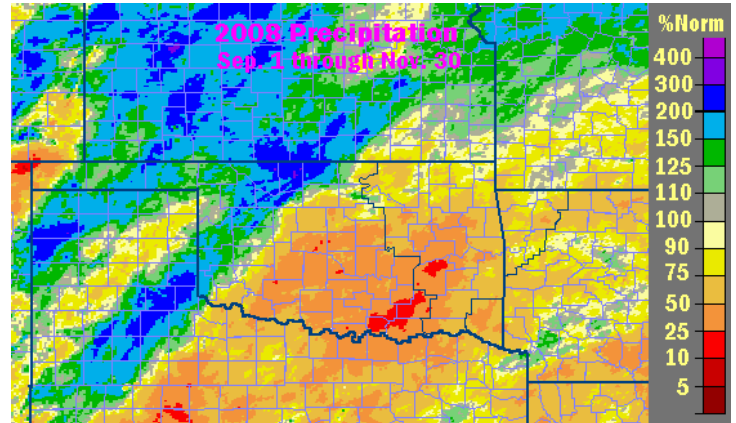
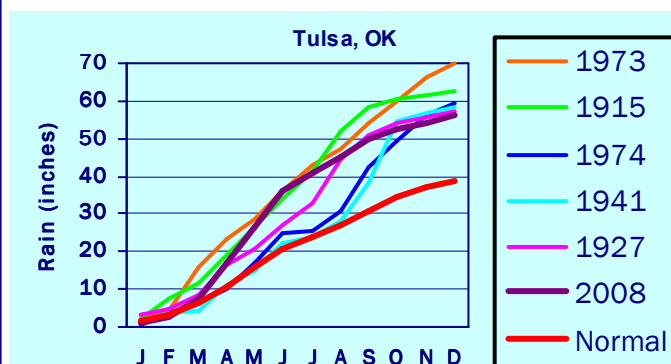
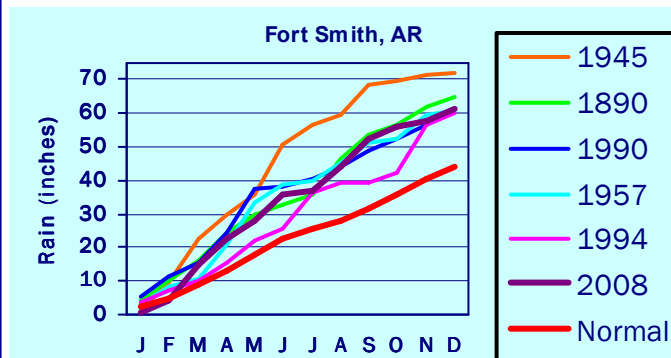
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## 2008 Rainfall

Earlier this year, it appeared that both Tulsa and Fort Smith were on a record pace for rainfall, and both sites would threaten their respective all-time annual rainfall records. Well, a drier-than-normal autumn basically put an end to that possibility as both locations entered December needing about 15 inches of precipitation for the month to reach the high water mark (pun absolutely intended)...a highly unlikely occurrence!

Nevertheless, both locations had a shot at the top five with a reasonable amount of precipitation. As of the end of November in Tulsa, even if no rain or snow fell in December, 2008 would have been the 9<sup>th</sup> wettest year on record with 54.32 inches. Similarly, Fort Smith 2008 precipitation would rank 6<sup>th</sup> of all-time. The final tally: Fort Smith did reach the top five with a total of 61.02 inches, good for fourth all-time. Tulsa, however, fell a little short. The 2008 total of 56.09 inches was good for seventh place.

Month-by-month trend of precipitation for the 5 wettest years on record, compared to 2008 and the climatological normal.



Back to the autumn rainfall for a moment; as you can see from the map at the top, virtually the entire NWS Tulsa forecast area saw below normal rainfall for the September through November timeframe – some areas much below normal (10 to 25 percent of normal). Even those areas impacted by tropical rains in September were below average for the season. As a result, a good portion of southeast and east central Oklahoma ended up with below normal precipitation for 2008. And, believe it or not, some of southeast Oklahoma actually ended the year in a moderate to severe drought!

According to the Oklahoma Climatological Survey, January 1 through August 31 of 2008 ranked as the wettest year-to-date on record in the northeast OK division, with rainfall at 158% of normal. But, by November 30, due to a second month in a row of drier conditions, the northeast OK climate division slipped to the 4<sup>th</sup> wettest year-to-date (Jan 1-Nov 30) period since records began in 1921.

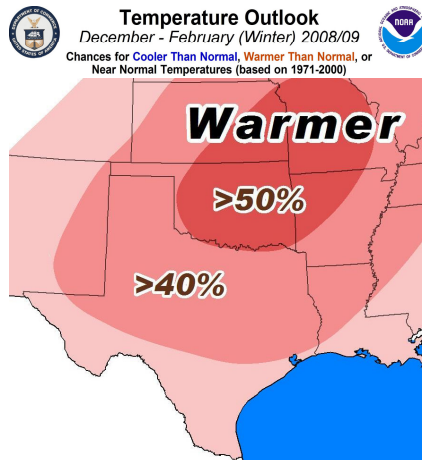


# Official Outlook for Winter 2008-09

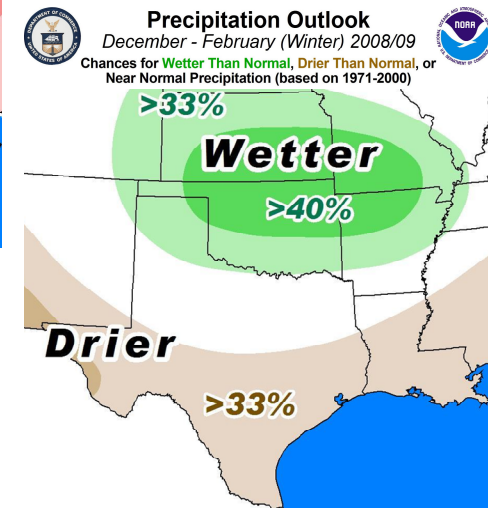
The Climate Prediction Center has issued its official outlook for the winter of 2008-2009

(December through February). At first glance the maps indicate a mild and wet winter is in store for eastern Oklahoma and western Arkansas, with "bull's-eyes" of both above normal

temperature and precipitation showing up over the region. But what they really say, of course, is about a 50/50 chance of above normal temperatures, and about a 40 percent chance of above normal precipitation (about a 60 percent of not above normal). These values represent the percent chance of exceeding the climatological average for the entire 3 month period.



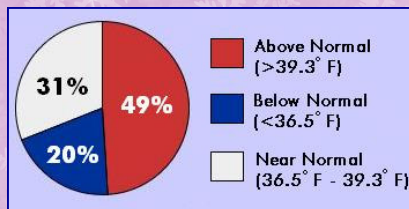
With the absence of La Niña and El Niño in the equatorial Pacific Ocean this, predicting weather patterns on seasonal timescales becomes increasingly challenging. Instead, other climate patterns over the Arctic and North Atlantic regions may play a significant role in influencing U.S. winter weather. Since these patterns are only pre-



dictable a week or two in advance, and tend to persist only for weeks at a time instead of an entire season, a better forecast for the upcoming season may be "variable"... nothing new around here!

## LOCAL OUTLOOKS

On the NWS Tulsa webpage, you may have come across a page called "Climate Prediction and Variability", which includes local 3 month outlooks. For those readers with an interest in statistical analyses, you will find a series of pie charts, graphs and tables that provide a more in-depth look at what the numbers mean.



For example, the pie chart for Tulsa International Airport shows a 49 percent chance of above normal tem-

peratures for the three-month period. More specifically, the table below indicates a 49 percent chance that the average temperature will exceed 39.3° F at Tulsa for the December through February period. But, don't forget that within the three month period, there could still be a week or two of brutally cold weather that will be enough to erase any memory of the "mild" weather the rest of the season!

## 2009 Spotter Training

The following sessions have been scheduled as of January

1. Check the NWS Tulsa web site for any additions.


DATE	COUNTY	CITY	TIME
1/19/09	Washington, AR	Fayetteville	7 PM
1/20/09	McIntosh	Eufaula	7 PM
1/22/09	Tulsa	Sand Springs	7 PM
1/23/09	Franklin	Charleston	7 PM
1/26/09	Sebastian	Ft. Smith	7 PM
1/27/09	Mayes	Pryor	7 PM
1/29/09	Creek	Bristow	7 PM
2/3/09	Pushmataha	Antlers	7 PM
2/7/09	Muskogee	Muskogee	6 PM
2/10/09	LeFlore	Poteau	7 PM
2/10/09	Nowata	Nowata	7 PM
2/12/09	Pittsburg	McAlester	7 PM
2/17/09	Sebastian	Greenwood	7 PM
2/19/09	Haskell	Stigler	7 PM
2/19/09	Crawford	Mulberry	7 PM
2/21/09	Washington, OK	Bartlesville	9 AM
2/23/09	Okmulgee	Okmulgee	7 PM
2/24/09	Benton	Bentonville	7 PM
2/26/09	Benton	Siloam Springs	7 PM
2/28/09	Tulsa	Tulsa	9 AM
3/2/09	Tulsa	Broken Arrow	7 PM
3/10/09	Latimer	Wilburton	7 PM

## Ice Damage Index

Ice Index	Radial Ice Amount (inches)	Wind (mph)	Damage and Impact Description
<b>1</b>	<0.25	15 - 25	Some localized utility interruptions possible, typically lasting only 1 or 2 hours maximum.
	0.25 - 0.50	<10	
<b>2</b>	<0.25	≥25	Scattered utility interruptions expected, typically lasting less than 8 to 12 hours maximum.
	0.25 - 0.50	15 - 25	
	0.50 - 1.00	<10	
<b>3</b>	0.25 - 0.50	≥25	Numerous utility interruptions, with some damage to main feeder lines expected, with outages lasting from 1 to 5 days.
	0.50 - 0.75	15 - 25	
	0.75 - 1.00	<10	
<b>4</b>	0.50 - 0.75	≥25	Catastrophic damage to entire utility systems, including both distribution and transmission. Outages could last from 1 to several weeks in some areas. Shelters needed.
	0.75 - 1.00	15 - 25	
	1.00 - 1.50	<10	
<b>5</b>	0.75 - 1.00	≥25	Prolonged & widespread utility interruptions, with extensive damage to main distribution feeder lines and possibly some high voltage transmission lines. Outages lasting 5 – 10 days.
	1.00 - 1.50	15 - 25	
	>1.50	<10	

**A**fter a series of devastating ice storms over the past decade, the Oklahoma Association of Electric Cooperatives (OAEC) sought help for real-time assessment and forecasts of ice accumulation on their power lines. The OAEC worked with the National Weather Service Forecast Office in Tulsa to address those needs. Using their experiences with previous ice storms, OAEC and NWS Tulsa developed the Sperry-Piltz Utility Ice Damage Index (SPI) following the January 2007 ice storm. The SPI was the creation of Sid Sperry, an official with the OAEC, and Steve Piltz, the meteorologist in charge at NWS Tulsa.

The SPI categorizes damage potential in five levels through the use of radial ice thickness and wind speed. Utility systems may be able to handle moderate ice accumulations, but stressed lines under wind forces are more likely to break. Therefore, one inch of ice may be a Level 2 or Level 3 ice event, but if wind speed exceeds 25 mph, it becomes a Level 5 event. The algorithm was tested in several ice events during the winter of 2007-2008.

The index values are derived from the forecast precipitation amounts and the forecast maximum wind speed for a given 24 hour period. Values are automatically updated with any subsequent forecast update. This allows utility companies to better prepare electric line crews for the potential damage that they may encounter. This will also help them determine well ahead of time where to send additional repair crews, where ice accumulations will be the most severe, and predict the amount of damage expected to a utility system. 

## Other News

### Crawford County is StormReady®

Crawford County, Arkansas was recognized as a StormReady® community on September 10. Steven Piltz, meteorologist-in-charge of the National Weather Service forecast office in Tulsa, presented the award at the last Quorum Court meeting. Crawford is the 11th Arkansas county to be recognized as Storm-Ready®, and the 17<sup>th</sup> county in the NWS Tulsa forecast area.

### Staff Changes

General forecaster Karen Trammell arrived in Tulsa in late October. Karen came here from the Chanhassen, MN office, and prior to that, was a meteorologist intern at WFO Norman.

Electronics technician Kennedy Richardson also arrived this fall.

Welcome Karen and Kennedy!

### Flood Stage Change

Effective October 24, the U.S. Geological Survey (USGS) changed the gage zero height on the river gage at Arthur City, TX on the Red River from 380.070 feet to 375.070 feet. This change was needed due to the significant erosion that has occurred in the river channel at this location causing the gage readings to record in negative values.

In addition, due to the adjustment of the gage zero height, the flood category stages cited in National Weather Service forecast products for the Red River at Arthur City have been changed as follows:

- Action Stage - 25.0 ft (was 20.0).
- Flood Stage - 27.0 f (was 22.0).
- Moderate Flood Stage - 30.0 ft (was 25.0).
- Major Flood Stage - 33.0 ft (was 28.0). 

# Winter Safety

On those occasions when bitter cold temperatures and snow and ice pay us a visit, it is always a good idea to keep winter weather safety in mind. Mostly, we think of safe driving and dressing appropriately for the cold when it comes to winter safety – and these are definitely important things to remember. Here are some of the less talked-about winter hazards.

## Thin Ice

In northern climates, recreation on frozen lakes is a way of life; from ice fishing to ice hockey. True, we see ice on ponds and lakes plenty here in the winter, but they are almost always unsafe. Why? Because of the temperatures swings that normally occur here in the cold season, water surfaces tend to freeze unevenly and thaw quickly. This cycle never really allows the ice to get thick enough to be safe – the general rule is about 4 inches thick for an average adult to walk on safely. Thus, it is best to resist the temptation and stay off the ice. Also, do not allow pets to walk on ice covered ponds.



Don't let THIS happen!

## Freezing Water Pipes

Another issue involving water concerns frozen pipes – something that happens almost without fail during a significant cold snap. The neat thing about water is that it expands when frozen. This creates tension from inside the pipe, sometimes leading to failure.

To prevent freezing of pipes:

- \* Drain swimming pool and sprinkler lines per manufacturer's instructions. Do not add antifreeze unless specifically directed.
- \* Remove, drain and store outdoor hoses.
- \* Keep garage door closed if there are water supply lines or water heaters in the garage.

- \* Open kitchen and bathroom cabinet doors to allow warmer inside air to circulate.
- \* Leave a small drip of water flowing from faucets, especially if they are served by exposed pipes.

## Shoveling Snow

Although we do not quite live in the “snow belt”, we do see occasional heavy snow events. For those who feel the need to keep the driveway clear, remember that shoveling snow is very strenuous work, particularly with the wet heavy stuff. Throw in the fact that cold weather makes it more difficult to work and breathe, and you have a very strenuous chore on your hands. Here are a few tips to keep you safe.



First, you may consider letting Mother Nature do the work for you. I know it's hard for some (myself included) to resist the urge to take shovel in hand as the first few flakes fall, but many times patience can pay off. The sun is likely to be out in a day or two and do the work for you – and really, what's a little snow in the driveway? This is especially true for those with existing heart conditions, high blood pressure, or who are typically inactive.

But, if you just can't let it go (yours truly), keep these things in mind:

- \* Dress in layers, and remove as necessary. Several layers of loose clothing are a better choice than a single heavy coat.
- \* Warm up and stretch beforehand.
- \* Start slowly, pace yourself, take breaks and by all means, keep yourself hydrated.
- \* Stand with your feet about hip width apart for balance, and keep the shovel close to your body.
- \* Bend at the knees, not with your back.
- \* If you feel any pain, dizziness or shortness of breath at all...STOP IMMEDIATELY!

Finally, if you don't like winter, be thankful that spring is never too far away! 🌧️



## Tropical

(Continued from page 1)

out of the area early on the 4th. As rain continued to fall during much of the day on the 3rd, flash flooding occurred across east central Oklahoma, west central and northwest Arkansas, primarily affecting low-lying areas, such as low-water crossings. While a number of county roads were damaged, significant flooding problems did not occur despite the copious rainfall, as overall rainfall was slow and steady. In addition to the minor flash flooding, the Poteau River near Panama reached its moderate flood stage on the morning of September 4th.

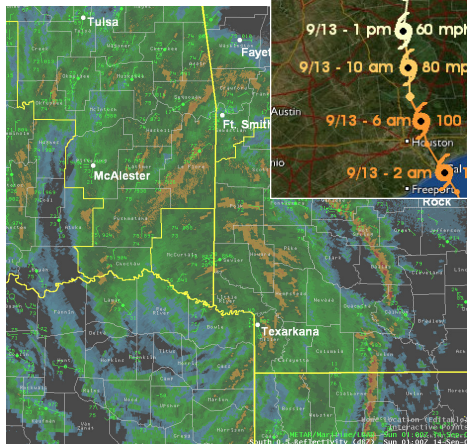
As Gustav was winding down, attention turned to powerful hurricane Ike, which was picking up steam and heading toward the Caribbean. Forecast models were beginning to indicate that Ike might take a similar track to that of Gustav. It was beginning to look like a repeat performance of a major hurricane in the Gulf within the next week to ten days.

As Ike continued to move toward the Gulf, moisture associated with pacific tropical storm Lowell was threatening to stream northeast toward Oklahoma from the southwest and a cold front was advancing from the north. Could this be a "perfect storm" of weather conditions to bring more flooding to already rain-soaked eastern Oklahoma and western Arkansas?

Fortunately, at least for this area, things did not quite line up that way, as the impact from Lowell remained focused just to the west and north of Tulsa's forecast area. Portions of north central and northwest Oklahoma were drenched with up to 10 inches of rainfall from the 11th to the 13th – some of which was even welcome in a drought-stricken area.

As Lowell's impacts on western Oklahoma began to wind down on the 13th, Ike was wreaking havoc on the Texas

gulf coast and was rapidly accelerating north toward northeast Texas. The center of Ike moved across far southeast OK during the evening of the 13th and quickly moved northeast through west central AR during the overnight hours. By the morning of the 14th, Ike was located across Missouri and all of the precipitation had ended across the Tulsa forecast area. Widespread rainfall of 2 to 4 inches affected far eastern OK and western AR, with amounts generally less than 2 inches elsewhere.



Radar image of Ike's remnants moving toward western Arkansas at 7 PM on September 13. Bands of high reflectivity (yellows and reds), generally corresponded with wind damage reports.

Some flash flooding occurred, with reports of flooded streets in Sequoyah County, OK and Washington County, AR. Some main-stem river flooding also occurred, with the Illinois River near Watts receiving moderate flooding, and minor flooding reported along the Illinois River near Tahlequah and the Poteau River near Panama.

While Ike's fast movement limited overall rainfall totals and flooding impacts, it did allow the system to retain tropical storm strength (40 mph sustained winds) as the center tracked toward west central Arkansas on the evening of the 13th. Reports of wind damage associated with Ike across northwest Arkansas began coming in during the early morning of Sep. 14 as the center tracked along the eastern edge of CWA.

Winds gusting to near 70 mph caused considerable wind damage and widespread power outages across Crawford County around 1:30 am, and across Washington and Franklin counties around 3:00 am. One home was reported damaged by a fallen tree near Mountainburg, while damage was also reported at Mulberry Mountain Lodge near Cass. A peak gust of 58 mph was recorded at Fort Smith Regional Airport just after 2 am, with some tree damage in the city of Fort Smith and in nearby Roland, OK.

Ike's remnants were quickly absorbed into the upper level winds and by the end of the day, were already near the Great Lakes. 